

FORM PTO-1390 (REV. 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 514453-3879
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (If known see 37 C.F.R. 1.5) 09/857652
INTERNATIONAL APPLICATION NO. PCT/EP99/09863	INTERNATIONAL FILING DATE 13 DECEMBER 1999	PRIORITY DATE CLAIMED 11 DECEMBER 1998	
TITLE OF INVENTION FERROELECTRIC ACTIVE-MATRIX DISPLAYS HAVING A BROAD OPERATING TEMPERATURE RANGE			
APPLICANT(S) FOR DO/EO/US Toshiaki NONAKA, Rainer WINGEN			

Applicants herewith submit to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

- ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
- ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
- ☒ This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)).
- ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
- ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - ☒ is attached hereto (required only if not communicated by the International Bureau).
 - ☐ has been communicated by the International Bureau.
 - ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
- ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
- ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - ☐ are attached hereto (required only if not communicated by the International Bureau).
 - ☐ have been communicated by the International Bureau.
 - ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - ☒ have not been made and will not be made.
- ☐ A English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
- ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
- ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

- ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
- ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
- ☐ A **FIRST** preliminary amendment.
- ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
- ☐ A substitute specification.
- ☐ A change of power of attorney and/or address letter.
- ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
- ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
- ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
- ☒ Other items or information:
PCT/ISA/210
PCT/IB/304, PCT/IPEA/402, 409, 416,

EXPRESS MAIL

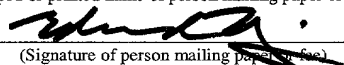
Mailing Label Number: **EL742692187US**

Date of Deposit: **June 7, 2001**

I hereby certify that this paper or fee is being deposited with the United States Postal Service

"Express Mail Post Office to Addressee" Service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents and Trademarks, Box PCT Washington, DC 20231.

Edward Nay
(Typed or printed name of person mailing paper or fee)


(Signature of person mailing paper or fee)

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.50)

INTERNATIONAL APPLICATION NO.
PCT/EP99/09863ATTORNEY'S DOCKET NO.
514453-387921. ☒ The following fees are submitted

CALCULATIONS PTO USE ONLY

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5):Neither international preliminary examination fee (37 CFR 1.482)
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO
and International Search Report not prepared by the EPO or JPO .. . \$1000.00International preliminary examination fee (37 C.F.R. 1.482) not paid to
USPTO but International Search Report prepared by the EPO or JPO \$860.00International preliminary examination fee (37 CFR 1.482) not paid to USPTO but
international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00International preliminary examination fee paid to USPTO (37 CFR 1.482)
but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00International preliminary examination fee paid to USPTO (37 CFR 1.482)
and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00**ENTER APPROPRIATE BASIC FEE AMOUNT =**

\$ 860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30
months from the earliest claimed priority date (37 CFR 1.492(e)).

\$

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total Claims	13 - 20 =	0	x \$18.00	\$ 0.00
Independent Claims	1 - 3 =	0	x \$80.00	\$ 0.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$270.00
TOTAL OF ABOVE CALCULATIONS =				\$
<input type="checkbox"/> Applicant claims small entity status. See 37 C.F.R. 1.27. The fees indicated above are reduced by 1/2.				+
SUBTOTAL =				\$
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$
TOTAL NATIONAL FEE =				\$ 860.00
Fee for recording the enclosed assignments (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				+
TOTAL FEES ENCLOSED =				\$ 860.00
				Amount to be refunded:
				\$
				Charged:
				\$

a. ☒ One check in the amount of **\$ 860.00** to cover the above fees are enclosed.b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
overpayment to Deposit Account No. **50-0320**. A duplicate copy of this sheet is enclosed.d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit
card information should not be included on this form.** Provide credit card information and authorization
on PTO-2038.**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

WILLIAM F. LAWRENCE, ESQ.
FROMMER LAWRENCE & HAUG LLP
745 FIFTH AVENUE
NEW YORK, NEW YORK 10151Dated: June 7, 2001

SIGNATURE

William F. Lawrence

NAME

28,029

REGISTRATION NUMBER

"as originally filed"

Ferroelectric active-matrix displays
having a broad operating temperature range

5 Replacement of the cathode ray tube with a flat panel screen requires a display technology which simultaneously makes it possible to achieve a high resolution, i.e. more than 1 000 lines, a high brightness ($> 200 \text{ Cd/m}^2$), a high contrast ($> 100:1$), a high frame rate ($> 60 \text{ Hz}$), an adequate color representation (> 16 million), a large image format ($> 40 \text{ cm}$), a low power consumption and a wide viewing angle, at low production costs. At present, 10 there is no technology which fully satisfies all these features simultaneously.

15 Many manufacturers have developed screens which are based on nematic liquid crystals and have been used in recent years in the field of notebook PCs, personal digital assistants, desktop monitors etc. Use is made here of the technologies STN (supertwisted nematics), AM-TN (active matrix - twisted nematics), AM-IPS (active matrix - in-plane switching) and AM-MVA (active matrix - multidomain vertically aligned), which are described in detail in the relevant literature (see, for example, T. Tsukuda, TFT/LCD: Liquid 20 Crystal Displays Addressed by Thin-Film Transistors, Gordon and Breach 1996, ISBN 2-919875-01-9 and the references cited therein; SID Symposium 1997, ISSN-0097-966X and the references cited therein). Furthermore, mention should be made of the technologies PDP (plasma display panel), PALC (plasma addressed liquid crystal), ELD (electro- 25 luminescent display), FED (field emission display) etc., which are also explained in the above-cited SID report.

30 Clark and Lagerwall (US patent 4,376,924) were able to show that the use of ferroelectric liquid crystals (FLC) in very thin cells results in optoelectrical switching or display elements which have response times which are faster by a factor of up to 1 000 compared with conventional TN (twisted nematic) cells (see, for example, EP-A 0 032 362). Owing to this and other favorable properties, for example the possibility of bistable switching and the fact that the contrast is virtually independent of the 35 viewing angle, FLCs are basically suitable for areas of application such as computer displays and TV sets, as shown by a monitor marketed in Japan by Canon since May 1995.